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NPIC/TSSG/RED-1752-69
15 August 1969

MEMORANDUM FOR: Deputy Chief, Research & Engineering Division, TSSG/NPIC

SUBJECT : "Unconventional Applications of Specialized Photographic Emulsions" by R.E. Smith, AEC, Published in, "Photographic Application", May 1969

1. Mr. Smith's thesis is that better results can be obtained when a photographic problem is attacked by tailoring film and chemistry selection to the specific need, rather than employing general purpose films and developers off-the-shelf.

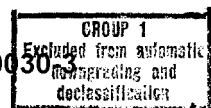
2. This is a good point, and one with which the film manufacturers agree. From the latter point of view, if quality alone were the consideration, there would be many more film/developer combinations available today, each treating a select range of tasks. This approach was taken with the Apollo program for the color film used, and for the systems with which we are concerned. It can be done wherever the objective justifies the cost, experimental time, etc.

3. Mr. Smith's experiments with an outdoor scene are impressive--but rely heavily on a high contrast object. A comparison with lower contrast objects is not shown or discussed. The point here is that the magnitude of difference may not be the same for both; in general, any tests to tailor film/developer combinations should employ a target or object similar to that of the intended application.

4. Smith's other two examples, photomicrography and time lapse micrography, both illustrate the technique to a degree dependent on the viewers knowledge of the object. This illustrates an important point: in each test the quality judgements made while supported with objective data, are subjective since the images examined were intended for human analysis. (If we could look at two aerial images with a visual difference similar in kind to illustrations B&C Figure 7, decide as Smith does that it has "enough useful information" for a given purpose, and be right, we would have a handle of quality assessment. The problem is receiving attention.)

5. One of the PAR's presently under review deals with this problem for specific targets--it asks the question, What can be done to optimize the result with each of these problem targets?

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6. It is this kind of unique problem for which the E.L. is structured;
e.g., (1) what is the optimum film/developer/object combination for making
filters for use in the coherent-optical data processor? (2) Can films of
the type discussed in the article be used to improve reproduction in our labs
under certain conditions? (3) Have we investigated the application potential
of the general and special purpose film/developer combinations available?

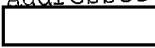
7. Mr. Smith's concluding comments on the requirement for high quality
optics are certainly valid. It should be noted that the optics too can be
special or general purpose. The Optical Quality Assessment program to be
implemented this year will attempt to define the situation for viewing
systems.



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